AD NUMBER

AD833636

NEW LIMITATION CHANGE

TO

Approved for public release, distribution unlimited

FROM

Distribution authorized to U.S. Gov't. agencies and their contractors; Critical Technology; SEP 1966. Other requests shall be referred to Department of the Army, Fort Detrick, Attn: Technical Releases Branch, Frederick, MD 21701.

AUTHORITY

Fort Detrick/SMUFD ltr dtd 15 Feb 1972

AD 808636

TRANSLATION NO. 1821

DA-18-064-CA-18-064-D6-00030(A)

DATE: 27 September 1966

DDC AVAILABILITY NOTICE

Reproduction of this publication in whole or in part is prohibited. However, DDC is authorized to reproduce the publication for United States Government purposes.

STATEMENT #2 UNCLASSIFIED

This document is subject to special export controls and each transmittal to foreign governments or foreign nationals may be made only with prior approval of DEPARTMENT OF THE ARMY
Fort Detrick
Frederick, Maryland 21701

1821

CA-18-064-D6-00030(A)

T-453- 1

27 September 1966

NEW DATA ON AGGLUTINATION OF ERYTHROCYTES

NEW DATA ON AGGLUTINATION OF ERYTHROCYTES*

Centralblatt für Bakteriologie und Parasitenkunde (Central Journal for Bacteriology and Parasitology), XLVI (1): 49-51, 1908

C. Moreschi, Institute for Medical Pathology, Royal University of Pavia

In connection with experiments performed jointly with Friedberger to accelerate hemolysis by precipitating sera (Centralblatt fur Bakteriologie und Parasitenkunde, Vol XLV, No 4), I performed similar experiments on agglutination. It turned out that the erythrocytes loaded with a dose of the corresponding and nonself-agglutinating immune serum clump together very rapidly and tenaciously if one uses as antiprotein serum a precipitating serum for the animal species which the amboceptor has produced.

In my experiments I used rabbit erythrocytes loaded with amboceptor of a goat treated for some time with rabbit erythrocytes. The serum of a rabbit treated with normal goat serum served as antiprotein serum.

Table 1

(1) Kaninchenblutkörperchen 5 Proz.	(2) Ziegenimmunserum	(3) Kaninchen präzipit. Serum	(4) Agglutination
1 ccm	0,005 ccm	0,0001 ccm	0
1 „	0,005 „	0,0005 „	(5) mäßig
1 „	0,005 „	0,001 „	(6) stark
1 „	0,005 „	0,005 „	(7) sehr stark
1 „	0,005 „	0,01 „	„ „
1 „	0,005 „	0,05 „	„ „
1 „	0,005 „	0,1 „	„ „
1 „	—	0,1 „	0
1 „	0,01 „	—	0
(8) 2 Stunden Zimmertemperatur. Zentrifugierung u. Waschung der Blutkörperchen mit Kochsalzlösung (0,85 Proz.)		(9) 2 Stunden bei Zimmertemperatur	

1 - Rabbit erythrocytes 5%; 2 - Immune goat serum; 3 - Precipit. rabbit serum; 4 - Agglutination; 5 - moderate; 6 - strong; 7 - very strong; 8 - 2 hours at room temperature. Centrifugation and washing of the erythrocytes with saline solution (0.85%); 9 - 2 hours at room temperature

It will be noted that neither the antiprotein serum by itself regardless of the dose nor the amboceptor serum in the doses under study and multiples thereof is able to agglutinate rabbit red corpuscles.

*Read on 29 September 1907 at the Berlin Congress for Hygiene and Demography.

In order to enable this special agglutination to show up clearly, it is absolutely essential to work with thoroughly washed, loaded erythrocytes since the presence of all the amboceptor serum, however small the quantity, interferes with the phenomenon. Agglutination occurs only when immune goat serum is used. It is absent when normal goat serum is used, even tho the conditions for precipitation are absolutely the same in both cases (Table II).

Table II

(1)	(2)	(3)	(4) Agglutination mit	
			(a) Immunserum	(b) Normalserum
			0	0
			(5) mäßig	0
			(6) stark	0
			(7) sehr stark	0
			" "	0
			" "	0
			" "	0
			0	0
			0	0

(8) 1 Std. Zimmertemperatur. Zentrifugieren u. Waschung d. Blutkörperchen mit Kochsalzlösung (0,85 Proz.)

(9) 2 Stunden Zimmertemperatur

1-9 - Same as in Table I; 4 - Agglutination with (a) immune serum (b) normal serum

Nevertheless, there is a definite connection. The erythrocytes in contact with the immune serum naturally become loaded with amboceptor, whereas they can draw from the normal serum little or no amboceptor. There still remains the possibility that there is a definitely relationship between the fixed immune amboceptors and the precipitating serum. The following fact indirectly favors this. When heated to 70°, the serum loses both its precipitating ability and its ability to cause the loaded erythrocytes to agglutinate (Table III).

It would be of great value to determine whether precipitation of the precipitin from the antiprotein serum by means of the precipitable substance has removed from the latter the capacity for bringing about agglutination.

According to the experiments performed jointly with Friedberger on accelerating hemolysis, it can also be shown in the case of agglutination that upon contact of the antiprotein serum with the loaded erythrocytes a minimal binding of the substance of importance for agglutination takes place. This substance, however, is difficult to identify and then only after the most careful consideration of the quantitative relations (Table IV).

Table III

(1) Kaninchenblutkörperchen 5 Proz.	(2) Ziegenimmunserum	(3) Kaninchen präzipit. Serum unerhitzt oder auf 70° erhitzt	(4) Agglutination (5) unerhitztes Serum	(6) auf 70° erhitzt
1 ccm	0,005 ccm	0,0001 ccm	0	0
1 „	0,005 „	0,0005 „	0	0
1 „	0,005 „	0,001 „	(7) mäßig	0
1 „	0,005 „	0,005 „	(8) stark	0
1 „	0,005 „	0,01 „	(9) sehr stark	0
1 „	0,005 „	0,05 „	„ „	0
1 „	0,005 „	0,1 „	„ „	0
1 „	—	0,1 „	0	0
1 „	0,01 „	—	0	0

(10) 2 Stunden Zimmertemperatur. Zentrifugierung u. Waschung d. Blutkörperchen mit Kochsalzlösung (0,85 Proz.) (11) 2 Stunden Zimmertemperatur

1 - Rabbit erythrocytes 5%; 2 - Immune goat serum; 3 - Precipit. rabbit serum unheated or heated to 70°; 4 - Agglutination; 5 - unheated serum; 6 - heated to 70°; 7 - moderate; 8 - strong; 9 - very strong; 10 - 2 hours at room temperature. Centrifugation and washing of the erythrocytes with saline solution (0.85%); 11 - 2 hours at room temperature

Table IV

(1) Kaninchenblutkörperchen	(2) Ziegenimmunserum	(3) Kaninchen präzipit. Serum ausgefällt oder nicht ausgefällt	(4) Agglutination (5) ausgefälltes Serum	(6) nicht ausgefälltes Serum
1 ccm	0,005 ccm	0,0001 ccm	0	0
1 „	0,005 „	0,0002 „	0	0
1 „	0,005 „	0,0001 „	0	0
1 „	0,005 „	0,001 „	0	(8) Spuren
1 „	0,005 „	0,002 „	0	(7) mäßig
1 „	0,005 „	0,001 „	(7) mäßig	„
1 „	0,005 „	0,006 „	„	(9) stark
1 „	0,005 „	0,008 „	„	(10) sehr stark

(11) 2 Stunden Zimmertemperatur. Zentrifugierung, Waschung der Blutkörperchen mit Kochsalzlösung (0,85-proz.) (13) 2 Stunden Zimmertemperatur

(12) 0,1 ccm Kaninchen präzipitierendes Serum wurde 2mal mit beladenen (0,01 Ziegenimmunserum per Kubikcentimeter) Kaninchenblutkörperchen einer 5-proz. Aufschwemmung ausgefällt und zwar jedesmal mit den Blutkörperchen von 10 ccm dieser Aufschwemmung.

1 - Rabbit erythrocytes; 2 - Immune goat serum; 3 - Precipit. rabbit serum precipitated or not precipitated; 4 - Agglutination; 5 - precipitated serum; 6 - nonprecipitated serum; 7 - moderate; 8 - Traces; 9 - strong; 10 - very strong; 11 - 2 hours at room temperature. Centrifugation and washing of the erythrocytes with saline solution (0.85%); 12 - 0.1 cc of precipitating rabbit serum was precipitated twice with loaded (0.01 immune goat serum per cc) rabbit erythrocytes in a 5% suspension and each time with the erythrocytes in 10 cc of this suspension

The facts that I have reported here on rabbit-goat amboceptor, the corresponding erythrocytes and the corresponding rabbit protein serum should also apply to other species of animals.

Likewise the specificity of the reaction should be the same, although further research might disclose whether the phenomenon appears in bacteria the same way that it does in erythrocytes.

It is unjustified, in my opinion, to look upon the data summarized above as a new starting point for explaining or offering theoretical interpretations of the rather delicate processes involved in agglutination.